

DTIC FILE COPY
AD A100899

~~LEVEL~~

10
102

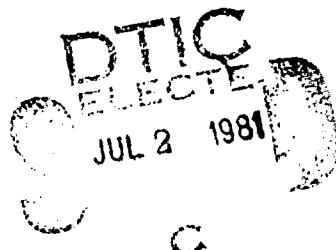
SOVIET PERCEPTIONS OF U.S.
ANTISUBMARINE WARFARE
CAPABILITIES

VOLUME I: EXECUTIVE SUMMARY

KFR 293-80 ✓

30 September 1980

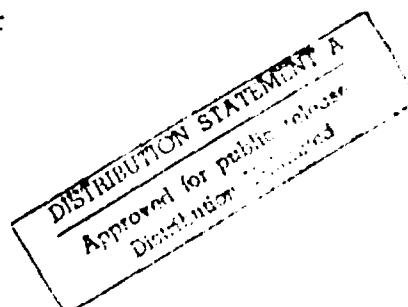
(Revised January 1981)



PREPARED FOR
U.S. ARMS CONTROL AND DISARMAMENT AGENCY

PREPARED BY

KETRON, INC.
18th Floor, Rosslyn Center
1700 N. Moore Street
Arlington, VA 22209



81701001

50272-101

REPORT DOCUMENTATION PAGE		1. REPORT NO.	2. AD-A100899	3. Recipient's Accession No.
4. Title and Subtitle Soviet Perceptions of U.S. Antisubmarine Warfare Capabilities.		I. Executive Summary Background Information Antisubmarine Warfare Capabilities		
7. Author(s) Robert W. Herrick Lois S. Lembo Mark A. Hainline		5. Report Date January 1981		
9. Performing Organization Name and Address Ketron, INC 18th Floor, Rosslyn Center 1700 N. Moore Street Arlington, VA 22209		8. Performing Organization Rept. No. #315-81		
12. Sponsoring Organization Name and Address U.S. Arms Control and Disarmament Agency 320 21st. Street N.W. Washington, DC 20451		10. Project/Task/Work Unit No. 11. Contract(C) or Grant(G) No. (C) AC9WC116 (G)		
15. Supplementary Notes		13. Type of Report & Period Covered Final		
16. Abstract (Limit: 200 words) This study addresses four primary questions: How frequently and in what contexts do the Soviets discuss U.S. ASW capabilities? How have the frequency and nature of Soviet commentaries on the subject changed? What U.S. ASW programs are the particular focus of Soviet commentary? What is the Soviet perception of U.S. anti-submarine warfare capabilities and how has it changed over the period 1960 - 1980? Answers to these and related questions have been derived from qualitative and quantitative content analyses of Soviet open-source national security publications. The commentaries sampled in the analyses - spanning the years 1960 to 1980 - represent the views of naval, military, and party/government leaders and spokesmen.				
17. Document Analysis a. Descriptors Antisubmarine warfare, Antisubmarine weapons, Submarine detection				
b. Identifiers/Open-Ended Terms SOSUS, Attack Submarines (SSN), ASW mines, P-3 Orion, Strategic ASW				
c. COSATI Field/Group Military sciences (Antisubmarine warfare) 15 01		19. Security Class (This Report) UNCLASSIFIED		
18. Availability Statement: Unclassified-unlimited		20. Security Class (This Page) UNCLASSIFIED		
			21. No. of Pages 184 50	22. Price

SOVIET PERCEPTIONS OF U.S.
ANTISUBMARINE WARFARE
CAPABILITIES

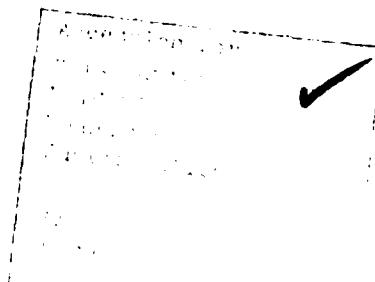
VOLUME I: EXECUTIVE SUMMARY

Prepared by:

Robert W. Herrick
Lois S. Lembo
Mark A. Hainline

With the assistance of:

Kenneth Shursey, Kilby Hickox and Barbara Gittleman



PF

TABLE OF CONTENTS

VOLUME I

	Page
INTRODUCTION	S-1
CONTENT ANALYSIS	S-1
THE DATA SOURCES	S-3
QUANTITATIVE METHODOLOGY	S-4
ANSWERS TO THE RESEARCH QUESTIONS	S-6
U.S. ASW PROGRAMS OF PARTICULAR INTEREST	S-11
Early 1960s	S-11
Late 1960s	S-15
Early 1970s	S-18
Late 1970s	S-21
CONCLUSIONS	S-25

EXECUTIVE SUMMARY

INTRODUCTION

During this study, we have sought answers to the following four questions posed by ACDA:

- How frequently and in what contexts do the Soviets discuss U.S. ASW capabilities?
- How have the frequency and nature of Soviet commentaries on the subject changed?
- What U.S. ASW programs are the particular focus of Soviet commentary?
- What is the Soviet perception of U.S. anti-submarine warfare (ASW) capabilities and how has it changed over the period 1960-1980?

Answers to these and related questions have been derived from qualitative and quantitative content analyses of Soviet open-source national security publications. The commentaries sampled in the analyses - spanning the years 1960 to 1980 - represent the views of naval, military and party/government leaders and spokesmen.

This Executive Summary presents qualitative and quantitative answers to the four substantive research questions listed above and reviews the methodologies in sufficient detail to allow the reader to understand the basis of our findings.

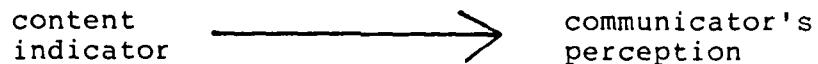
CONTENT ANALYSIS

It can be said that two major branches of content analysis exist today. Quantitative content analysis emphasizes the analysis of the frequency of appearance of so-called content indicators. Qualitative content analysis focuses on the interpretation of content within a broad context of events, institutional relationships and communications. Each of these streams has strengths and weaknesses which complement those of the other approach; for this reason both have been employed in this study.

Quantitative content analysis is a research technique that attempts to determine by the rigid definition of content variables, coding rules and an analytic scheme what is being said on a given topic by a given set of people at a given time. Analysts using this method aim at attaining reproducibility of results and claim that the tool will

better achieve that goal than will the classical scholarly methods of textual analysis. In fact, its proponents claim that the value of the quantitative technique is its ability to move the explication of content away from the old social science debate over the selection of relevant data and focus attention on the data's implications.

Within the field of quantitative content analysis, inference is generally made according to a single model:

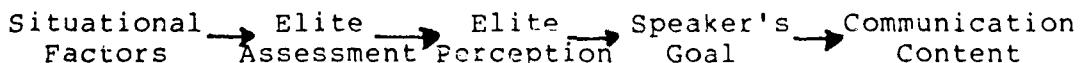


For instance, a Soviet statement to the effect that SSBNs are invulnerable to detection and attack by hostile antisubmarine forces would be interpreted as reflecting the communicator's view that SSBNs are indeed invulnerable.

Many individuals would argue, however, that this simple model is not an accurate reflection of reality -- that communicative behavior is much more complex than the technique acknowledges. For example, elite perceptions are probably frequently not directly related to content indicators in propaganda. This flaw and other conceptual and mechanical problems inherent in the technique lead to a general loss of descriptive power and firmness in the research process as a series of "quick fixes" patch up conceptual holes. An alternative approach to that of the quick fix offers greater benefits; however, that is the approach of qualitative content analysis.

Qualitative content analysis is more than a supplementary device to quantitative content research; its practitioners strive to produce scientifically valid results which can stand on their own. Its aim is to go beyond the simple description of content indicator frequency offered by quantitative techniques and lay bare the purposes for which a communication is made. Qualitative content analysis differs from quantitative content research chiefly in assuming that single occurrences of symbols in communications can be significant; a further important difference is that it considers the full context in which a content indicator appears.

Qualitative content analysis of communications such as propaganda structures a research effort using a model of elite behavior such as the one shown below.



Qualitative content analysis is a useful tool because it escapes many of the mechanical and conceptual problems of

quantitative techniques. Nonetheless, it remains prey to many of the same arguments used against traditional document analysis. The flexibility which is its strength is also a weakness; because it opens the way to subjective interpretation of a statement, it also opens the way to analytic disagreement over a statement's meaning. The result is that qualitative analysis often cannot create results which are reproducible or upon which two different analysts can agree. However, by combining both qualitative and quantitative content analysis, an analyst can supplement the weakness of one with the strength of the other. The dangers of inference introduced by the qualitative technique's reliance on analytic interpretation and ambiguous non-content data are backstopped by the strengths of the quantitative method. This study therefore employed both approaches to answer the four questions stated above.

THE DATA SOURCES

The full bibliography was compiled after an exhaustive search of pertinent Soviet publications held by the Library of Congress and other sources; it includes every item which, when located, was judged to concern submarine or antisubmarine warfare. Although this meant that many items in the full bibliography potentially held no information on U.S. ASW capabilities, this approach was chosen both because preselection of sources would be costly and might bias the results and because it would provide one measure of the proportion of attention the Soviets devote to consideration of U.S. ASW as compared to ASW topics in general. The literature review uncovered a total of 853 sources representing the years 1960 to 1980. The total number of entries in each of the time periods* (1960-1965, 1966-1970, 1971-1975, 1976-1980) varies considerably, but a broad selection of material is represented in each.

Bibliographic entries included in the quantitative analysis were chosen through a random sample of fifty entries from each time period. The qualitative content analysis involved a purposive sample of the full bibliography; that is, the most "promising" entries were reviewed for pertinent information.

* The twenty years of this study have been aggregated into four temporal periods of roughly five years each corresponding to the timing of Communist Party Congresses. This approach was adopted because the data available is insufficient to support a year-by-year analysis and because shifts of opinion and policy in the Soviet Union largely occur in conjunction with the Congresses.

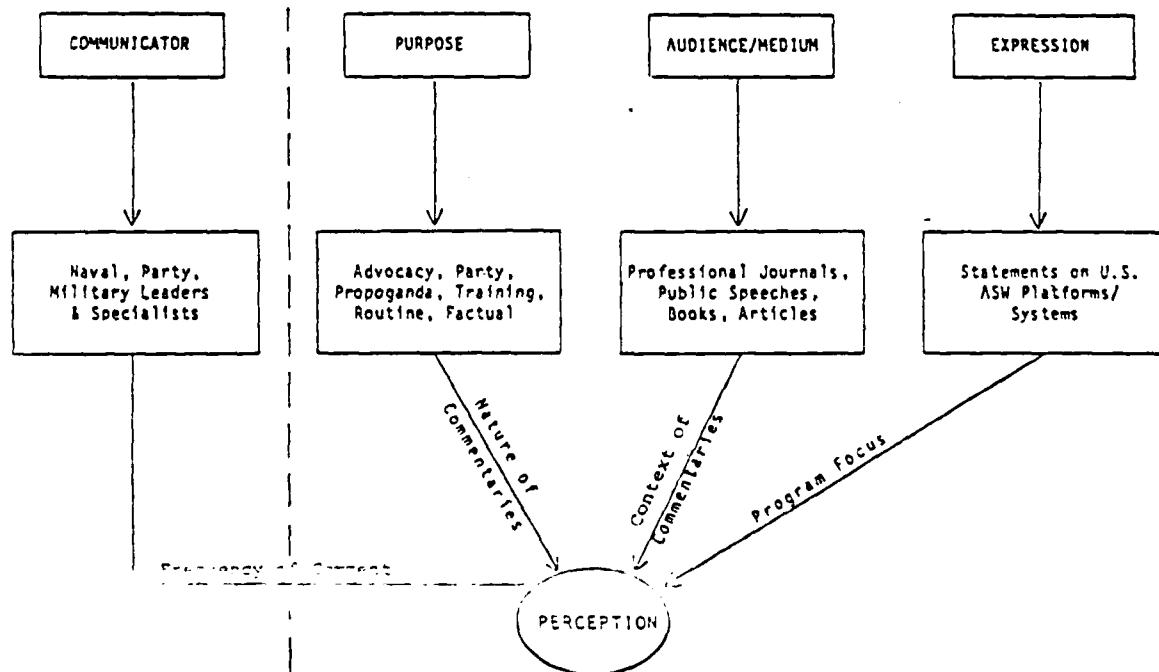
QUANTITATIVE METHODOLOGY

Variable Definition

During the first phase of this quantitative content analysis effort, the conceptual approach was established and corresponding decisions on the unit of content, the symbology, the universe of communication and sampling were made. In this early phase many of our initial assumptions about the source material and its content were tested and revised.

In quantitative content analysis an iterative approach is often necessary. This was the case with developing a conceptual framework for this study which would link the raw data to the four substantive research questions. The approach which was adopted relates content indicators of communicator, medium, purpose and the expressions themselves directly to research questions on the context, nature, focus and frequency of commentaries. The relationship between content indicators and research questions is shown more explicitly in Figure 1, below. The answer to the primary question - "What is the Soviet perception of U.S. ASW?" - is inferred through a synthesis of data and a comparison of data with trends identified in a chronology of ASW related developments.

FIGURE 1. CONCEPTUAL APPROACH



Data Generation

The fifty entries for each period were read by the project reader in the original Russian. For every statement on U.S. ASW appearing in the sampled entries, the platforms and systems to which it related were coded, along with other summary and supplementary data. Finally, a translation of the entire statement was included on the coding sheet. Allowable expressions were those relating directly to U.S. ASW or which were attributed to "U.S. specialists".

Data Preparation

Coded expressions were then classified according to their content and the platform or system to which they referred.

First, Soviet mentions of U.S. ASW programs were divided into eight groups, almost all of which pertain to a specific type of ASW platform. These eight groups are:

- Submarines
- Surface Combatants
- Aircraft Carriers
- ASW Helicopters
- Carrier-based ASW Aircraft
- Land-based ASW Aircraft
- ASW Sensors
- ASW Weapons

Secondly, each expression was classified as to its content. These content categories included:*

- Advantage over other means;
- Effective Threat;
- Operational Capability;

* Content categories are described in detail in Volume II, Part II-B of this report.

- Operational Limitation;
- Technical Description;
- Improving;
- Mention; and
- Other

Subjective interpretation of passages was kept to a minimum by dual coding; that is, two analysts familiar with the literature agreed upon the proper coding of each item. It should also be noted that neither content categories nor subject platforms/systems are mutually exclusive. In addition to the tabulation of content for each platform type, a frequency count of platforms and systems mentioned by name was made without regard to the content of the expression.

ANSWERS TO RESEARCH QUESTIONS

How frequently and in what contexts do the Soviets discuss U.S. ASW capabilities? How have the frequency and nature of Soviet commentaries changed?*

Introduction

In answering these questions, the quantitative and qualitative analyses examined different characteristics of the relevant literature. While the quantitative effort assessed "frequency" by looking at the composition of the full bibliography over time and the percentage of entries which contain substantive comment on U.S. ASW, the qualitative analysis viewed frequency as the relative amount of commentary within related articles. The quantitative effort analyzed "context" as the media represented in the bibliography, and "nature" as the purpose of intent (e.g. advocacy, training, propaganda, etc.) of each entry containing pertinent references. Qualitatively, the two concepts were combined: attention to U.S. ASW by Party, Navy and military leaders served as a proxy for both content and nature. Finally, both analyses characterized the content itself. In the case of the quantitative analysis, each idea or expression about U.S. ASW was classified as belonging to one of five perceptual categories (or one of three miscellaneous, non-perceptual categories) while the

* These two research questions are treated concurrently in this section, as they are closely related to each other.

qualitative analysis described the content somewhat more broadly. In the paragraphs which follow, each of the aspects of the literature is reviewed.

Frequency

Quantitative content analysis assumes that the frequency of comment on a given topic is an indication of level of interest in that subject. As a measurement of Soviet interest in ASW in general and in U.S. ASW in particular we therefore examined the composition of the complete bibliography for each time period and the percentage of sampled entries which contain substantive comment on U.S. ASW.

The quantitative findings conclude that Soviet interest in ASW in general has remained relatively stable over time, although considerably fewer articles on ASW-related topics were found for the first period (1961-1965) than for later periods. This discrepancy is believed to be due to extraneous factors such as the Navy's lower profile in the military hierarchy in earlier years and correspondingly fewer publications dealing with naval topics.

Interest in U.S. ASW, however, has fluctuated considerably over the four periods. For the first period, twenty-four percent of the sampled entries contained some substantive reference to U.S. ASW; from 1966-1970 the figure had dropped to sixteen percent. By the third period, Soviet interest in topics relating to U.S. antisubmarine warfare efforts were expressed in over a third of the sampled articles. In the final period the figure dropped to only twenty percent.

The qualitative analysis has assessed the degree of Soviet interest by noting changes in the amount of substantive Soviet commentary on U.S. ASW within related articles. Although one cannot give definitive conclusions in this regard, since sampling was purposive rather than random, it appears that the trend is toward increasing comment on U.S. capabilities over the period studied, with a slight decline in the rate of growth of commentary during the fourth period.

Content and Nature

The qualitative analysis viewed the context and nature of commentaries on U.S. ASW as the distribution of substantive comment among naval, military and party/government figures. During the early sixties, discussions of U.S. ASW by Army figures comprised only about a seventh of the total

and interest shown by Party leaders was negligible. The bulk represented naval views. Later in the decade, Army interest rose considerably, and then waned during the early to mid-seventies. Most recently, Army commentary has once again increased, and Party and other government interest has finally been shown. The analysis postulates that ASW is now perceived by Party and non-defense government officials as a meaningful aspect of the Soviet Union's military problems. Party concern also provides evidence that ASW has gained recognition as a significant factor in the political-military equation. Qualitatively, one can conclude that U.S. ASW capabilities were already being discussed in Soviet naval circles with high frequency in 1960 and have commanded increasing naval attention ever since. Army commentary, quite understandably, is issue-related and appears to peak whenever the Navy's campaign for more naval forces uses U.S. ASW as a justification. For example, Army interest increased in the early seventies, when a naval-Ministry of Defense debate as to whether air-capable ships would be chosen as a main Soviet ASW force type occurred. The Defense Ministry argued for a supporting role for surface combatant ships, while the Navy asserted a need for new ASW aircraft carriers.

An increase in Party (and propaganda) commentaries in recent years was also noted in the quantitative analysis, which approached the problem of identifying the nature of the commentary somewhat differently. Rather than infer whether each statement reflected the military, political or naval view, it identified the "purpose" of each bibliographic entry. Possible categories included advocacy (naval), factual, routine, propaganda, Party, training and military advocacy. In general, it was found that Soviet interest in U.S. ASW is usually expressed in bibliographic entries discussing substantive topics, i.e., those advocating (or announcing) a naval policy or those simply recounting factual material. "Foreign Naval Chronicle" items and short, unsigned articles in the Naval Digest have been the typical sources of commentaries of such factual nature. In terms of advocacy, many of the signed articles in the journals and newspapers and virtually all of the books that at least touch on the subject of U.S. ASW appear quite unmistakably to be maximizing (or minimizing) the "threat" of U.S. ASW-related material found in publications classified as routine, propaganda, party, training and military advocacy. The chief exception, in fact, occurred in the final period, when twenty percent of the comment was found in propaganda and Party-oriented entries.

The quantitative analysis concluded that the fact that U.S. capabilities have not been traditionally discussed in

propaganda pieces suggests that the Soviets are not highly concerned with them. The exception may be the fourth period, when Party comment did appear to be significant. As recent experience with the neutron bomb and ground-launched cruise missiles indicates, when the Soviets are worried by weapons developments, they react strongly with propaganda. Similarly, the fact that rote presentations, such as the routine celebrations of Navy Day or invocations to improve training, do not contain references to U.S. ASW capabilities suggests that these capabilities do not loom large in the Soviet mind.

By far, most references to U.S. ASW are found in books and journal articles directed at the naval professional. Although newspapers are well represented in the full bibliography - making up from 16% to 28% of the total - on only one occasion did a quantitatively sampled news article contain a reference to U.S. ASW. Clearly, the topic is reserved for professional naval rather than public consumption. In fact, the sources in which most comment appeared are not likely to be read in even Party and military circles. To some extent, this situation in the Soviet Union is similar to that obtaining in the United States, where an analysis would doubtlessly show that Soviet ASW capabilities are discussed predominantly in professional naval circles and that the U.S. military and political leadership is relatively little concerned with them.

Comment

A final way of describing the structure of Soviet commentaries on U.S. ASW is to look at the "perceptual framework" of each expression. For the quantitative analysis, we classified content as to whether it referred to a platform or system's advantages, effectiveness, capabilities, limitations, or improvements. (Additional, non-perceptual categories included "Technical Description", "Mention" and "Other".) As shown in Table 1, most expressions dealt with improvements in U.S. ASW platforms, systems, or forces in general. The "Improvements" category also included, for example, reports of increases in ASW-related expenditures and "attention" to ASW shown by the United States. The exception to the predominance of improvements in the perceptual structure of the commentaries occurred in the second period (1966-1970), when discussions of U.S. platform capabilities dominated the literature.

TABLE 1

PERCENTAGE COMPOSITION OF SOVIET PERCEPTUAL COMMENT IN U.S. ASW

Perceptual Category	Time Period	1961-65	1966-70	1971-75	1976-79
Advantage Over Other					
Means		4	3	4	6
Effective Time		8	11	9	5
Operational Limitations		15	8	12	6
Operational Capability		31	47	18	30
Improving		42	31	57	55

Perceptual categories were defined as generalized "themes" in the qualitative analysis. In the first two periods, encompassing the decade of the sixties, three themes were found to be most frequently used. These were: (1) factual descriptions of U.S./NATO ASW forces, weapons and sensors; (2) U.S. efforts to develop an adequate antisubmarine defense against Soviet submarines; (3) Portrayals of U.S efforts to protect the country against SSBN strikes that (largely unconsciously) mirror-imaged Soviet thinking and planning in this regard. During the first half of the seventies, a new topic emerged: description of the various ASW "forces and means" in the U.S. ASW inventory and their relative advantages. The continuing difficulty of the initial detection of a submarine was also a frequent theme. The "state" importance of ASW to the USSR was a renewed, if only occasional, context and probably was engendered by the 1972 ABM Treaty. Prior to that Treaty it appeared that the USSR anticipated eventually developing an ABM capability against our Polaris/Poseidon missiles. Once that long-term expectation was ruled out by the signing of the Treaty, the Navy's lack of ASW capability against nuclear-powered submarines in the open oceans led to the emphasis on ASW as a mission of "state" importance to which must not only every service contribute according to its individual capabilities, but also which could, on a priority basis, command resources for R&D work related to finding adequate means for detecting SSBNs initially and locating and tracking them continuously in peacetime or destroying them in wartime.

The only changes in perceptual context for the Soviet commentaries on U.S. ASW in the final four years subsequent to the XXVth Party Congress in March 1976 were noticeable

increases in the attention accorded to ASW in commentary on U.S./NATO naval exercises and operations, and in propaganda material (including some for recruiting).

What U.S. ASW programs are at the focus of Soviet commentary?

Throughout the twenty years studied, there have been rather sharp fluctuations in the level of Soviet interest in specific platforms, systems and programs. As a result, one cannot say that any particular area of U.S. ASW development has consistently been of high interest to the Soviets -- although in a given time period such expressions of interest do appear.

Furthermore, Soviet mentions either of groups of U.S. ASW programs (e.g., submarines) or of specific programs (e.g., SPRUANCE destroyers) do not appear to be correlated with chronological developments. There is no strong relationship between mentions by Soviet writers and U.S. interest in either program groups or specific programs. Although certain new programs stimulate a high level of interest when they first appear, such as with SUBROC in Period 1, other programs may be considered interesting even when they have long been in existence. Few U.S. efforts have been mentioned prior to substantial development. In answering this question, then, we present our findings in chronological order.

Early 1960s

An overall measure of interest in ASW -- and, perhaps especially in ASW systems procurement -- is, of course, the budget allocated for that purpose. The qualitative analysis showed that Soviet reports of U.S. budget allocations to ASW from 1960 to 1966 were distorted, probably to maximize the results to support the Soviet Navy's advocacy of greater appropriations for larger general-purpose naval forces for SSBN protection and for anti-SSBN ASW. The data became less exaggerated towards the end of the period but failed to reflect significant decreases in the actual U.S. ASW budgets for 1964 and 1965.

Both the quantitative and qualitative analyses showed that U.S. SSNs and the newly deployed SUBROC were of the greatest interest to Soviet naval leaders in the early 1960s. (Their perception of the emphasis placed by the U.S. on designing nuclear-powered boats able to dive deeper and run quieter and faster in fact reflected the Soviet Navy's preoccupation with designing the very fast, deep-diving titanium-hulled Alpha Class SSN.) Despite a seeming belief

that the U.S. has erred in designing "multi-purpose" submarines rather than optimizing SSNs for ASW, commentaries on THRESHER, SUBROC and other SSN developments were frequent and detailed. In fact, the criticism that the "multi-purpose" SSNs being constructed by the U.S. were not particularly satisfactory for ASW did not last long and the loss of the USS THRESHER in 1963 was soon realized by the Soviet Navy not to reflect any basic design weaknesses that could not be corrected. Having evinced concern at the prospect of the U.S. eventually having a large force of highly ASW-capable SSNs, Soviet naval writers exaggerated the numbers in construction and their technological improvement, described U.S. SSN characteristics, and discussed SSN capabilities and the missions to which they would be assigned.

Quantitatively, submarines and their weapon and sensor systems were found to have received more attention than any other platform or system; specific classes (particularly THRESHER/PERMIT and SUBROC) were frequently mentioned by name.

The entries covered in the qualitative and quantitative analyses displayed a substantial amount of interest in surface combatants, the "missile-torpedo" or missile-depth charge ASROC and the pilotless helicopter DASH. Qualitatively, the degree of interest was about equivalent to that accorded SSNs, whereas the quantitative approach showed the topic as being of somewhat lesser importance. Given the preponderance of new surface ship classes (eight were introduced from 1961-1965), the amount of comment is hardly surprising.

Frequency, however, is not necessarily an indication of concern or perceived threat, and there is evidence that Soviet perceptions were indeed otherwise. The limitations of surface ships were discussed somewhat more often than those of other platforms, and the qualitative reading suggests that the Soviets believed that the U.S. was squandering its resources on investment in new conventional surface combatants and modernization of existing ships. In fact, it seemed virtually certain that the Soviet Navy did not consider that the destroyers of the U.S. Navy constituted any significant danger to Soviet SSBNs in the event a war should break out in the 1960s. Soviet ship construction later in the decade exemplified their view that they saw the evolution of the VTOL ASW aircraft carrier (ASW cruiser) as a more promising line of development.

Similarly, the Soviet naval hierarchy was critical of the United States lack of commitment to the antisubmarine

aircraft carrier (CVS) and carrier-based ASW aircraft. CVSS were perceived by Soviet naval sources as being misused for point-defense of the CVAs rather than for open-ocean ASW hunter-killer force searches for the enemy's SSBNs. The fact that the U.S. was not building CVSs for ASW against nuclear-powered submarines appeared to be considered by Soviet naval sources as a serious error in judgment and, probably, as missing the best developmental route for producing an eventual capability to achieve some meaningful degree of damage-limiting capability against the opponent's strategic submarines.

The low frequency of comment on carriers (quantitatively, less than 3% of the period's commentary) was taken as reflecting the Soviet Navy's frustration in not being able to justify expenditures on carriers to military and political audiences on the basis of U.S. efforts. This frustration emerged because the U.S. Navy had not chosen the task-specific CVS construction route that the Soviet Navy strongly favored and thereby deprived the latter of the most relevant example that conceivably could be cited to silence the objections of Army detractors of building the many large air-capable ASW ships that were central to the Navy's planning to create a significant open-ocean ASW capability. At this stage, the SEA KING helicopters and TRACKER airplanes then aboard CVSs were not of any great interest, probably because they had very limited capabilities against nuclear-powered submarines, as Soviet naval writers were to comment.

Neither were VP airplanes of great interest or concern during the early 60s. The steady U.S. replacement of the P-2V NEPTUNE with the P-3A ORION was reported, and the characteristics and capabilities of the new ORION were described, but no mention was made of the P-3A's ability to employ SOSUS vectors to make initial contact on Soviet submarines in the open ocean. The potential threat from land-based aircraft was asserted to be predicated upon future improvement of the range of ASW sensors carried onboard the ORION. Also in this time period, first mention was made concerning U.S. development of A-NEW, which was billed as an integrated system of sensors and weapons for the next generation of U.S. maritime patrol aircraft.

Another program of significant interest during the period was SOSUS. As with later periods, few references to SOSUS or its predecessors were found in the quantitative

study. The qualitative analysis uncovered many, appearing throughout the two decades.¹

Qualitative analysis showed that there is evidence that the Soviets were aware of the long-term implications of SOSUS, although it was not perceived as an immediate or mid-term threat. Nonetheless, SOSUS was perceived as being of absolutely vital importance to any eventual success the U.S. ASW effort might be able to achieve in open-ocean detection and peacetime tracking or wartime destruction of those of the Soviet Navy's SSBNs on combat patrol in areas of SOSUS coverage. The Soviets asserted that all of the U.S. advances in ASW weapons systems (SUBROC, ASROC, DASH, A-NEW) would be of no help until the key problem of initial detection of submarines in the open ocean has been resolved either by SOSUS or by a "technological breakthrough" for ASW forces. Reports on the projected but unsuccessful ARTEMIS deep-water hydrophone system reflected a Soviet Navy perception that the U.S. did not, at least at that time, have an "effective system" for long-range detection of Soviet submarines operating in the open Atlantic or Pacific. The general Soviet consensus regarding SOSUS was that it was not a short (3-5 years) or mid-term (5-10 years) threat but, in effect, could potentially constitute an effective substitute for the "technological breakthrough" that could make the oceans transparent.

Mines of the U.S. Navy were virtually ignored in the Soviet open literature during this time period. This correlates with the lack of interest in the subject being evinced

¹ The scarcity of quantitative data may be attributed to a variety of structural factors. First, many of the commentaries on SOSUS capabilities are implicit rather than explicit, and the quantitative content analysis methodology is designed to capture what is written rather than what is implied. For instance, reference to "other means" would be coded as a miscellaneous expression rather than as a possible allusion to SOSUS or a SOSUS-type system. Secondly, many of the discussions of SOSUS appeared in journal articles dealing exclusively with that topic. The quantitative analysis is inclined to pick up themes which appear throughout a variety of media. U.S. SSN capabilities, for example, would likely be discussed in articles dealing with Soviet submarines in general as well as in pieces relating directly to the role of attack submarines in ASW. This is not the case with SOSUS: since a few specific articles were not included in the sample, few references were found in the collated quantitative data.

by the U.S. Navy at a time when the mine had lost out completely, although only temporarily, to the general preoccupation with nuclear-missile weapons. There were evidently no U.S. plans for a mining campaign against Soviet submarines in general or SSBNs in particular at any stage in their wartime mission profile from sortie from their bases, transit through the chokepoints, and out to the open ocean and return. Furthermore, there was no evidence of plans for using Air Force or commercial aircraft for mining and it was noted that even the P-3A ORION would need modification before it could carry mines.

Late 1960s

The qualitative analysis showed that Soviet reports of U.S. budget allocations to ASW in the 1966-1971 period were portrayed in as exaggerated form as they had been in the early 1960s and with such inconsistency as to indicate that no Party line or internal Navy position had been established. As in the 1960-1966 period, large U.S. budget decreases in the latter half of the period (1968-1969) were unreported (although, as in the earlier period, official U.S. data had been published), pointing to deliberate exaggeration for internal advocacy purposes.

SSNs received more Soviet attention than any other platform or system during the second half of the sixties, as they had during the earlier half. Both quantitative and qualitative analyses show the paramount significance of SSNs -- their improvements, capabilities, and likely effectiveness -- in the Soviet mind. It is clear that the prospect of a larger, better U.S. SSN force in the mid to long-term -- depending on future rates of construction -- was carefully noted by the Soviets. (This was evidenced by a doubling of the number of Soviet commentaries on U.S. SSNs compared to the previous period.) By 1968-1969, SSNs were being called "the most important means" of ASW. The concern with SUBROC displayed during the earlier years all but disappeared as the sixties drew to a close, quite likely both because the Soviets came to the view that weapons are no better than the sensors available and because the "newness" of the weapon had worn off by this time.

A new theme, that SSNs were considered by the U.S. to be the main ASW force, appeared in 1968 and was to continue for a decade before disappearing from the Soviet public media. From the goal of 64 SSNs in 1966, the U.S. was seen by the time of the XXIVth Party Congress in March 1971 as aiming at a force level of about 100 SSNs.

The fundamental ASW problem, the poor capabilities of ASW sensors for long-range detection, was still unsolved, and the Soviets continued to view it as virtually insoluble through the end of the decade. In 1966 the Soviets indicated that SOSUS detection capabilities, especially against Soviet SSBNs, were little improved and would be largely ineffectual if war broke out. While in 1967 the chances of SOSUS ever becoming a deep-water, ocean-wide system seemed so slim that the Naval Digest over-hastily wrote the whole system off as of much too limited potential, only three years later the standard Soviet naval perception of SOSUS had changed from one limited to the "oceanic approaches" to the U.S. East and West coasts to that of a system intended eventually to be "global" in its coverage. By 1970 U.S. attempts to develop a global SOSUS increasingly implied to the Soviets that their SSBNs would be threatened in the long term future, although this threat was not yet perceived to be an "unmanageable" one. As the seventies began, SOSUS was described as incapable of determining the location of submarine contacts with a precision adequate for vectoring aircraft and ships to the contact, but its potential ability to do so was understood implicitly.

Because of the perceived limitations of the SOSUS system and the resultant difficulty in long-range detection, shore-based VP aircraft were of little interest. Only a negligible number of references to VP aircraft were found in the quantitative analysis for the 1966-70 period, a result substantiated by the qualitative study. This may reflect the lack of prospects for the Soviet Navy's own VP airplanes which lacking a SOSUS system or its mobile equivalent to provide vectors on submarine contacts, were pictured in 1970 as without a future in ASW barring successes in increasing detection ranges.

Improvements in the ORION were noted, as the P-3C ORIONS gradually replaced the P-3A/B ORIONS. The P-3C had the capability to carry the A-NEW integrated sensors-weapons suit which the Soviets recognized as a big improvement for localizing and attacking (or tracking continuously in peacetime). However, they made pointedly clear that A-NEW contributed nothing in the way of a long-range detection capability to supplement or replace SOSUS. The improvements were thus viewed as enhancing ORION's capabilities for localization rather than for long-range detection and the Soviets therefore evaluated them as being of little consequence for solving the key problem of initial detection.

The attention given to destroyer-type surface combatants increased but continued to be routine in content

as in the early sixties. The general Soviet view was that the great bulk of the U.S. destroyer force would be required for point defense of the aircraft carrier forces and merchant ship convoys. Only an occasional Soviet naval commentator, in trying to make a case for the U.S. Navy having anti-SSBN ASW as a priority mission, would claim that the U.S. Navy planned in wartime to employ at least a significant number of destroyer-type ships not only on the ASW barriers but for open-ocean search for submarines (i.e., anti-SSBN ASW).

The qualitative analysis found that a new appreciation of the role of surface ships in ASW was expressed during this period. This very likely was the result of the introduction of new destroyer-type classes with enhanced ASW capability into the Soviet Navy, and the potential of increasing the effective range of ships by means of helicopters. The Soviet Navy regarded with interest U.S. announcements made in 1968 and 1971, respectively, of plans for large construction programs of frigates and destroyers to be equipped with (improved) ASW helicopters and ASROC. One Soviet source even alleged that the U.S. was considering construction of a dynamic-lift ship of destroyer size that would regain for surface combatants their former speed advantage over submarines.

U.S. CVSS were seldom discussed and then only in reference to their role in ASW hunter-killer groups. The lack of CVS development and construction continued to be among the most important reasons for Soviet Navy perceptions of the U.S. ASW efforts being unfavorable. As noted earlier, in failing to design and build a CVS specifically for ASW against nuclear-powered submarines the U.S. was perceived as neglecting to take the optimum ASW development route.

During this period the CVS formed part of a debate between the Navy and the Defense Ministry marshals and other senior Army officers who were seen as eager to seize on the U.S. scorning the CVSSs as not cost-effective to oppose the Soviet Navy's desire for substantial numbers of "ASW cruisers". There was thus little naval incentive to refer to the United States' lack of commitment to the concept of the ASW aircraft carrier. This situation finally led Soviet naval sources (on several occasions) to allege falsely a high U.S. interest in developing and building a considerable number of task-specific CVSSs. This all transpired in the context of a continued low level of commentary on large air-capable ASW ships of only about one per year.

The quantitative study did indicate some Soviet interest in carrier-based aircraft, displayed primarily in

discussions of their tasks and capabilities. The preferred Soviet naval ASW-carrier aircraft, the VTOL, was first mentioned in this period and the S-3A VIKING was given favorable mention as the first ASW airplane designed for carrier operation that had been designed for use against nuclear-powered submarines.

During the 1966-1971 period mines and mine warfare were seen by Soviet naval sources as still of little interest to the U.S. Navy. The slight U.S. interest that was discerned was seen to be concentrated in the areas of logical concern to the Soviet Navy -- offensive mining both by air and submarine. The first suggestions of any forward movement in U.S. mine development were commentaries that the Mark-52 and Mark-55 air-delivered ASW mines were being improved and that U.S. submarines allegedly were being loaded with some ASW mines.

Early 1970s

Soviet commentaries on U.S. budget allocations to ASW between 1971 and 1976 were too few and too scrambled to indicate anything other than that the information given was being carefully selected with an eye more to internal-advocacy needs to support larger general purpose naval forces than to provide the readers with the objective facts.

As was the case in previous periods, the quantitative analysis found few explicit references to SOSUS (only six) while the sensitivity of the qualitative approach allowed it to gather considerable information on the topic. SOSUS was portrayed in Soviet naval writings during the 1971-1976 period as still intended eventually to afford "global" coverage. It reportedly was undergoing rapid integration into a worldwide surveillance system of the U.S. armed forces that would incorporate all feasible means of submarine surveillance (from satellites and commercial airlines to reporting by oceanographic survey and merchant ships) so as to provide nearly real-time vectors on submarine contacts to the ASW forces, particularly to VP airplanes. According to Soviet writers, the area-limited deep-ocean systems, such as AFAR in the Azores and SEA SPIDER north of the Hawaiian Islands, were demonstrating the possibilities for wide-ocean SOSUS coverage sufficiently well to leave little room for doubt that SOSUS eventually would be able to detect a large proportion of SSBNs maintained on peace-time combat patrols in the open ocean.

Soviet commentary, although only moderately concerned in tone, was divided between warnings to the naval professionals that SOSUS must be taken as a serious long-

term threat and reassurances that for the time being it still had inadequate range and effectiveness to threaten Soviet submarine operations. For the first time, a description of the SOSUS system appeared in a book with a "general" (i.e. other than naval) readership, but the subject was still avoided in nearly all major military and naval works.

The most radical change in Soviet attitudes over the previous decade was on the topic of VP aircraft. Despite the introduction of improved ORION aircraft, the potential threat from shore-based VP had previously been downplayed, when acknowledged at all. For the first part of the 1970's, however, the quantitative analysis shows a jump in the proportion of commentaries relating to VP. In fact, shore-based VP airplanes were the subject of double the number of commentaries in the 1971-1976 period than in the preceding five-year period. A concentration of those entries was in the area of improvements in VP capabilities, as was exemplified by the first two references in late 1975 and early 1976 to the P-3C ORION's capability to exploit SOSUS data for vectoring them into direct contact with submarines operating in the open oceans. The January 1976 commentary in Naval Digest provided the first public acknowledgment that VP aircraft vectored by SOSUS constituted "a highly effective" ASW force. The qualitative reading suggests that the importance of VP was stressed to "undo" the past downgrading of the threat. It was readily apparent that the U.S. VP had gained a greatly enhanced position in Soviet naval perceptions due primarily to its SOSUS connection.

The quantitative analysis displayed little change in attention paid to SSNs, and a slight decrease was noted on the qualitative side. The numbers of SSNs reported in commission were exaggerated by about 20 percent for most of the period, only a part of which seems likely to have been the result of the lagging U.S. construction rate; deliberate exaggeration by the Soviet Navy to help justify more ASW forces was deemed to account for a substantial share of the exaggeration. Most of the quantitatively assessed commentary dealt with improvements in and technical descriptions of SSNs, no doubt spurred by the beginning of construction of the LOS ANGELES (688) Class SSN. The Mark-48 submarine-launched torpedo, introduced in 1974 after 12 years of development, also received substantial attention in the media reviewed in the quantitative reading.

Aircraft carriers, other surface combatants, and helicopters each were shown to have received substantial notice during the period but the quantitative approach could do little to sort out the perceptual component. The qualit-

ative conclusion was that the Soviet perception was one of being rather favorably impressed by the developments that took place during 1971-1976 with respect to destroyer-type ships and ASW weapons systems.

In particular, the Soviets viewed the projected 30 destroyers of the SPRUANCE (DD-963) class with interest. They were noted to be slated to receive the latest in weapons and sensors, including piloted LAMPS helicopters to replace the remote-controlled DASH helicopters and ASROC with inflight guidance and a better torpedo component (the Mark-46 to replace the Mark-44).* However, the cost of the SPRUANCE destroyer was noted to have increased from \$60 million to \$110 million each. This was seen, in effect, to have priced the U.S. Navy out of the market for the large number of such ships required just to do all of the point-defense of aircraft carriers and merchant ships convoys anticipated in wartime, let alone enough additional ships to make a major damage-limiting contribution to anti-SSBN ASW by open-ocean search.

The Soviets evidently also believed that surface displacement ships had only limited growth potential for ASW, even with helicopters. A fair indicator of this attitude was their indiscriminate and overly enthusiastic approach to U.S. Navy experiments with new dynamic-lift ships. Despite a Naval Digest article in August 1975 which attempted to temper the general enthusiasm, prototype U.S.-hydrofoil and air-cushion ASW ships for possible ocean ASW were viewed with unwarranted enthusiasm. This commentary, however, was more reflective of internal advocacy than of a conviction that the U.S. was moving rapidly to embrace such a radical solution to the ASW problem.

Helicopters, however, were seen as an effective means for greatly extending the capabilities of surface displacement ships. The piloted LAMPS helicopter, reported as scheduled to replace the remote-controlled DASH helicopter, gradually was appreciated to be a much more effective system than DASH. LAMPS was seen as holding promise to enhance U.S. ASW capabilities significantly in the near and mid-term and to be of great importance in

*ASROC itself was pictured in a much more critical light than before. The accuracy of the missile was asserted to be low (due to the fact of its ballistic-trajectory flight being unguided) and the Mark-44 torpedo part was criticized as ineffectual against submarines moving at speeds over 13 knots.

overcoming the inferior speed of ships as compared to submarines. A drawback was that full deployment of LAMPS would be a lengthy process. The net Soviet perception apparently was that it would be mid-1980 or later before the great bulk of the U.S. Navy's destroyers and frigates had all received their LAMPS. The concern with LAMPS inferred in the qualitative analysis is borne out in the quantitative phase: helicopters received more comments than any other U.S. platform.

The qualitative approach shows more interest in mines was expressed during the early to mid-seventies than before, although they were not viewed by Soviets as an immediate danger. The Soviets paid particular attention to the first postwar development by the U.S. of new ASW mines: the "mine-torpedo" CAPTOR and the bottom-laid QUICKSTRIKE mine. CAPTOR was described in ways that implicitly emphasized its particular suitability for use against SSBNs by mine blockade of Soviet submarine bases and by use on ASW barriers across the major geographic chokepoints of the "world ocean". CAPTOR was reported to have begun unit production in 1972 and was not to be scheduled for mass production until 1977 or 1978. The apparent slowness with which these mines were being procured evidently caused the Soviets to regard their development as they had SOSUS a decade earlier -- as a professionally interesting development that posed no medium-term threat but one that required continuing observation to avoid unpleasant surprises over the long haul.

The main focus of Soviet naval commentary during this time period with regard to major U.S. air-capable ship types was on the replacement of CVSS by CVS and SCS. This focus was in fact exaggerated because of Gorshkov's campaign to overcome Army opposition to, and win Party authorization for, the sizeable number of "ASW cruisers" that would be required to begin to address the Soviet ASW problem. Despite the exaggeration, however, there was evidently an underlying Soviet naval perception that the potential effectiveness of U.S. ASW in the future had been diminished greatly by the U.S. failure to build large numbers of major ASW surface ships for open-ocean ASW. A further reflection of this is the fact that carrier-based helicopters were not criticized (as they had been previously) nor did any Soviet naval sources find it necessary to further defend the value of helicopters operated from large air-capable ships.

Late 1970s

As in the preceding periods, Soviet reports on the U.S. ASW budget appear to reflect manipulation for internal

political purposes, although they are the most accurate yet to appear. Soviet naval writers are presenting the data in terms creating the false impression that ASW has grown in its percentage share of the total U.S. military budget and, in one case, obscured a substantial if temporary decrease in U.S. funds allocated to ASW.

The qualitative study found that SOSUS is the primary focus of 1976-80 commentaries. This reflects increased Soviet concern over the potential of early detection of both Soviet SSBNs and attack submarines before missile launch. This was further demonstrated by the developments cited by the Soviets which would potentially enhance SOSUS coverage in the 1980s, such as new towable and portable sonars. For the first time, the United States' SOSUS system was acknowledged by Soviet naval persons as presenting a current threat to both Soviet submarines, and, in general, SOSUS was perceived as likely to become highly effective against Soviet submarines operating in the SOSUS areas of coverage.

This concern over SOSUS most recently expressed in the media is carried over to VP airplaces, almost certainly because of their synergistic interaction in the prosecution of submarine contacts in the open ocean, with the ORION exploiting SOSUS data to establish and maintain contact with Soviet submarines. The generally laudable tenor of commentary found in the qualitative analysis is not reflected in the quantitative findings which indicate that both SOSUS and VP were given comparatively scant attention by Soviet naval sources.

Both the qualitative and quantitative studies agree on the recent importance of U.S. submarines in the Soviet view. In fact, over a third of the quantitative data from this period referred to U.S. submarines and their sensors. The qualitative analysis also concludes that SSN development and construction evoked a high level of Soviet interest, even showing an increase over prior years. Atypically, not one of the SSN-related passages was qualitatively unfavorable and considerable interest in the LOS ANGELES class was noted in both analyses.

The Soviets perceived that U.S. SSN construction had suffered a further lag and had decreased to only one per year being delivered to the U.S. Navy. The 2nd edition of Admiral Gorshkov's Seapower of the State gave the Soviet naval perception of the SSN force level as about 90. U.S. failure to build a new class of submarines with the improved ASW characteristics that the U.S. Chief of Naval Operations reportedly announced in 1977 probably convinced Soviet naval sources that the U.S. Navy is not necessarily concentrating

its ASW efforts on submarines, as alleged earlier by Soviet submarine proponents, presumably in an effort to win increased construction of ASW submarines for the Soviet Navy.

The qualitative analysis shows an increased concern with respect to U.S. mine developments. The U.S. budget for mine warfare, although modest in comparison with other naval "forces or means" was noted to have quadrupled between 1975 and 1977, which presumably would support the continuation of recent R&D work which had produced the new CAPTORS, QUICK-STRIKES and SLMMs. The Soviets' criticism of the United States' lack of attention to mines earlier in the decade turned sharply into an acknowledgement of an immediate and growing capability. The U.S. is no longer criticized for neglecting mine warfare, nor is the U.S. mine stockpile any longer dismissed as being of "limited value". Rather, the U.S. is now seen as having very substantial capabilities for ASW minelaying, especially in those areas where the possibilities for destroying Soviet SSBNs are greatest. These areas are the approaches to submarine bases, those of home water stationing or transits, and at geographic chokepoints. These generally are areas of fairly shallow water in which ASW mines can be effectively employed.

A significant new fact emerged in 1977 in the form of a claim that mining would be important in a nuclear-missile war as well as in a conventional war. A claim from the previous period that the GIUK Gap could be mined "in just a few days" by B-52s laying CAPTOR mines was supplemented by two claims that it could be done with an impressively small number of mines; according to one, only 200 mines would be required. These two estimates are only fractions of the 1,000 CAPTORS reportedly already delivered to the U.S., so mining the GIUK Gap, at least as far as the availability of mines is concerned, already is perceived as an existing U.S. capability.

U.S. surface combatant programs are viewed by the Soviets in a less favorable light. Destroyer-type ASW ships have continued since March 1976 to be perceived as low on the U.S. Navy's priority list in view of the unimpressive performance tolerated in the construction program of the SPRUANCE class destroyers and the slow production rate of the O.H. PERRY (FFG-7) and other classes.

In addition to what the Soviets perceive as an indifferent U.S. approach to destroyer construction, the unsuitability of destroyers and frigates for open-ocean search due to their low speeds continues to be noted. It is also noted that, due to the high cost involved, destroyers

are being replaced by the less expensive frigates. Some Soviet naval sources also make insinuations regarding U.S. development of, and preference for, ocean-going dynamic-lift ASW ships but these comments seemed to be aimed at the internal audiences in the Defense Ministry and Party to increase support for the Soviet Navy's own programs for construction of dynamic-lift ships.

ASROC is seen by the Soviet naval profession as now incorporating the superior Mark-46 torpedo which the Soviets perceive as adequate for use against nuclear-powered submarines. However, nothing has been reported in the Soviet media concerning necessary improvements to the missile part of ASROC since a 1976 commentary which mentioned a feasibility study the U.S. Navy was conducting on adapting the HARPOON missile for that purpose.

The most significant progress in surface combatant weaponry noted by the Soviets is the bringing to fruition of the LAMPS Mark-III helicopter. The potential importance of the Mark-III LAMPS apparently is diminished for the Soviets by the facts that the number planned for procurement is only one fourth of what they calculate to be NATO requirements and can only be provided to the newest destroyer-type ships. Furthermore, despite its greatly improved capabilities, the Mark-III LAMPS is perceived as of questionable importance, since the Soviets believe it to be of insufficient range for open-ocean search.

The Soviets have mixed feelings about the major U.S. ASW ships as well. Soviet commentaries on major U.S. air-capable ships have focused on CVs and the no-longer operational CVSSs and the never built SCSSs. They continue to devote attention to the latter two ships, apparently to encourage development of such ships within their own Navy. Probably for this purpose, they are propagating a fictional U.S. construction program of over six dozen of such ships allegedly to carry VTOL aircraft.

Soviet naval sources continue to perceive the U.S. Navy as unwise for neither developing large VTOL-carrying ASW surface ships for open-ocean search for Soviet SSBNs nor building task-specific antisubmarine aircraft carriers optimized for open-ocean ASW. The repeated comment by Soviet naval sources that the S-3A VIKING, the latest (and most highly regarded) operational ASW aircraft for use from large air-capable ships, is eight to ten times more effective than its predecessor, the S-2 TRACKER, suggests that the Soviet experience with VTOL aircraft on the KIEV Class ASW cruisers may have persuaded the naval leadership of the need for a higher performance ASW aircraft than a

VTOL type can provide for the nuclear-powered aircraft carrier alleged by Gorshkov to be under construction in the USSR.

What is the Soviet perception of U.S. antisubmarine warfare capabilities and how has it changed over the period 1961-1979?

INTRODUCTION

In answering this final and most important research question posed by ACDA, we must rely most heavily on qualitative results. Although definitive conclusions as to the frequency, nature, and content of Soviet commentaries have been drawn from the quantitative study, the data generated by the quantitative approach cannot begin to match the depth of analysis achieved by the qualitative effort in answering this final question. The realm of interpretation - looking at communications in their full historical context - is the almost exclusive monopoly of qualitative content analysis.

Our conclusions as to Soviet perceptions of U.S. ASW capabilities have been drawn from our responses to the questions above and from the evidence and analysis which is contained in Volume II of this report. The final, "bottom line" response is preceded by supporting conclusions vis-a-vis Soviet perceptions of individual aspects of U.S. ASW "forces and means" and the U.S. ASW effort in general.

CONCLUSIONS

1. The logical contextual question of whether or not the state-of-the-art in ASW might have improved sufficiently in Soviet perceptions to be considered to have adequately overcome the great lag behind the state-of-the-art of submarine warfare incident to the provision of nuclear propulsion and nuclear-missile weapons to submarines in the '50 must now be answered in the affirmative. This is seen by Soviet naval sources to be the case only for the U.S. but not for the USSR as a result of the U.S. Navy's development of SOSUS as, in effect, an off-the-shelf substitute for a technological "breakthrough" in ASW capable of "illuminating the underwater environment to the extent of making it increasingly transparent" - the great detriment of Soviet SSBNs operating in the open ocean.

2. SOSUS has been perceived by the senior officers and specialists of the Soviet Navy since the early 1960s as potentially the key element in providing the initial

contacts on enemy submarines which otherwise would be even more difficult to locate in the open oceans than the proverbial needle-in-a-haystack. The U.S., by exploiting existing technology for constant incremental improvements, is seen as having produced a system that, if not truly "global" in scope, covers large areas of the Atlantic and Pacific including a good share of Soviet home waters and has the capability for continuous peacetime tracking of all submarines within the SOSUS zone of coverage. The fact that SOSUS is the only U.S./NATO ASW system whose alleged vulnerability has not been extensively discussed in the open Soviet media (except for one sotto voce mention that SOSUS is vulnerable to Soviet weaponry) suggests that the prompt disablement of the system at the outbreak of war is a concern of Soviet war planners.

3. While both the land-based P-3C ORION and the aircraft carrier-based S-3A VIKING are noted in Soviet writings to have outstanding open-ocean area search capabilities, the latter (along with its CV platform) is seen to be absorbed in point-defense ASW and only the former is expected to be available for open ocean search for the USSR's strategic submarines. Whether used with SOSUS vectors or without them to fill in the oceanic gaps in SOSUS coverage, the VP (after being minimized or ignored in the '60s) has been seen ever since as the most mobile of the various ASW forces and with an incomparable capability for rapidly searching sizeable ocean areas with a high probability of detecting any submarines present. In fact, utilizing SOSUS vectors from a network of bases around the Atlantic and Pacific Ocean peripheries, VP airplanes are perceived as constituting an immediately ready force that could wreak havoc on Soviet SSBNs in the open oceans as long as the SOSUS system were functioning.

4. The Soviets believe that the optimum line of development in ASW surface combatant design is that of the large air-capable ships, such as the KIEV class. Only such ships, they believe, can provide the capabilities necessary for carrying out successful open-ocean searches for SSBNs. In their view, therefore, the United States has erred seriously by concentrating its ASW surface combatant construction on destroyers and frigates and by ignoring the potentialities of either large ASW mission-specific aircraft carriers or the smaller sea control-ship.

5. Destroyers and frigates, due to their much slower speeds, have lost out completely in Soviet perceptions to aircraft as open-ocean ASW search platforms. The great initial enthusiasm to find for the Soviet Navy a substitute

for displacement ships in ones operating on dynamic-life principles (an over-enthusiasm which was attributed with marked exaggeration to the U.S. Navy in an apparent effort to justify greater appropriations to the Soviet Navy for development of such craft) has been tempered by time and the failure of both countries to develop really successful hydrofoil, air-cushion, or wing-in-ground prototypes that could even partially replace either aircraft carriers (and other major air-capable ships, the "ASW cruiser" in the Soviet case) or even destroyer-type escort ships.

6. Before committing the mobile ASW forces of the U.S. Navy (its surface combatants, ASW aircraft, and especially the ASW submarines) to ASW missions in Soviet home waters, the U.S. is perceived as intending to attempt to resolve the ASW problem by laying mine barriers off the known naval bases and in the key "straits and narrows" that restrict the Soviet Navy's access to the open oceans.

7. With the Delta Class SSBNs having sufficient missile range to launch their missiles successfully from home waters (or even from out-of-the-way "maneuvering bases" or from under the Arctic ice cover) and with the bulk of the Yankee Class to be withheld in home waters to favorably influence intrawar bargaining and war-termination negotiations (except for any called upon after the initial nuclear exchange to sortie into the oceans to destroy targets which the Strategic Missile Forces had failed to take out), the Soviets perceive the losses by enemy SSNs and mines as unlikely to grow to an unacceptable level in view of the Soviet Navy's already great and steadily improving capabilities for protecting its SSBNs in home waters (including with the Kiev Class ASW cruisers, with the USSR's considerable mine-countermeasures capabilities, and especially with the new, fast, deep-diving Alpha Class SSN). On the other hand, the mission-completion capabilities of Soviet SSBNs are perceived by the Soviets to be anything but assured. Those out on combat patrol prior to the outbreak of war are subject to possible continuous tracking by SOSUS (or, conceivably, to trailing by SSN) and prompt destruction at the outset of hostilities, whereas those SSBNs retained in home waters have to anticipate operating in a hostile ASW environment of mines and SSNs.

8. The USSR perceives that its losses in SSBNs to U.S./ NATO ASW in the country's home waters will be roughly proportional to the number of strategic submarines which the USSR tries to "breakout" through the ASW barriers that are expected to be established across the constricted SSBN transit routes to the open ocean. Soviet comments have

noted that the ASW practice of both sides would involve the destruction of all unfriendly submarines detected, whether tactical or strategic. Consequently, Soviet SSBNs would be sunk along with Soviet attack submarines at any point in the home waters' part of their mission profiles, even if the U.S./NATO ASW effort had been mounted primarily against the Soviet attack submarines as part of a sea-control/SLOC-protection mission.

9. The U.S. is perceived currently as unlikely to mount a major anti-SSBN ASW effort in the open ocean since it would require dedicating a necessarily large share of its very limited ASW resources to that mission at the expense of its basic sea control mission for SLOC protection. This was not always the Soviet view. U.S. ASW forces' forward deployment/readiness was perceived during the 1960-1966 period as nearly continuous and at "combat-alert" status with at least one ASW aircraft carrier hunter-killer group in the North Atlantic and one in the Western Pacific. VP airplanes were reported to be constantly engaged in ASW search operations and the bulk of the sizeable reserve ASW forces of the U.S. Navy were reported as held in 24-hour readiness in U.S. homeports. Soviet perceptions of U.S. ASW forces' forward deployment/readiness were modified over the following decade and emphasis was placed instead on the rapidity with which the "limited" ASW forces maintained in operation in peacetime could be built up whenever required. There were reports of U.S. VP airplanes making "systematic" peacetime ASW patrols over chokepoints and of single VP squadrons of 10-12 airplanes being forward based at a wide variety of points in both the Atlantic and Pacific Oceans.

In light of the above points, one can finally conclude that the Soviet naval perception of U.S. ASW capabilities is that, while U.S./NATO ASW forces could sink a cripplingly large percentage of Soviet submarines in the initial period of war if adequate preparations for protecting them were not made in advance of hostilities, the Soviet Navy possesses extensive capabilities for protecting its submarines while in home waters and, if required at all to sortie the bulk of its submarines into the oceans, has the option of waiting until the initial strategic exchange of a nuclear war has degraded U.S./NATO ASW "forces and means" (including SOSUS). Nevertheless, the gross U.S./NATO ASW capability (largely employing SOSUS-vectorized shore-based VP airplanes in the open oceans and attack submarines and ASW mines in Soviet home waters) is perceived as a formidable threat, one against which the mission-completion capabilities of Soviet submarines, including the SSBNs, are anything but assured.

Rather, the results are unpredictably shrouded by the "fog of war" and will depend to a considerable extent on the skill and fortitude of the Soviet Navy's (untested) command personnel.

In the '60s when SOSUS was perceived as only a long-term threat, when the U.S. force of SSNs was only half its present size, and before the U.S. Navy had developed an ASW mine capability of substantial proportions, the combined U.S./NATO ASW threat was perceived as a considerable but quite manageable problem. Today the SOSUS system appears to constitute a real and expanding global threat of early detection of Soviet submarines that patrol or transit in its area of coverage. The U.S. force of SSNs has almost reached ten score in number and are perceived as being steadily improved qualitatively and as constituting a formidable threat to even the Soviet Delta Class submarines operating in home waters. The U.S. is known to be developing new and more effective types of mines. As these U.S. ASW capabilities continue to improve in the 1980s, Soviet naval sources anticipate that it will become increasingly difficult to assure the mission-completion capabilities of the Yankees, Deltas, and follow-on classes of Soviet SSBNs unless effective Soviet measures are taken to offset growing U.S. ASW capabilities.